What is claimed is:

1. A rapid diagnostic test system comprising:

a light source for illuminating a medium containing a sample under test, wherein the medium comprises a labeling substance that binds a persistent fluorescent structure to a target analyte; and

a first photodetector positioned to measure light from a test area of the medium.

2. The system of claim 1, wherein the light that the first photodetector measures has a frequency characteristic of fluorescent light resulting from the light source illuminating the persistent fluorescent structure.

3. The system of claim 2, wherein the persistent fluorescent structure comprises a quantum dot.

4. The system of claim 2, wherein the medium comprises a lateral-flow strip for performing a binding assay, and the test area contains an immobilized substance that binds to and holds a complex including the labeling substance and the target analyte.

5. The system of claim 1, further comprising:

a second photodetector; and

an optical system positioned to receive light from the test area, wherein the optical system separates light having a first frequency from light having a second frequency so that the first photodetector measures light having the first frequency and the second photodetector measures light having the second frequency.

6. The system of claim 5, wherein the optical system comprises a diffractive element that directs the light of the first frequency on the first photodetector and directs the light of the second frequency on the second photodetector.

7. The system of claim 5, wherein the optical system comprises a color filter that transmits light having one of the first and second frequencies and reflects light having the other of the first and second frequencies.

8. The system of claim 5, wherein when the light source illuminates the persistent fluorescent structure, the persistent fluorescent structure emits light having the first frequency; and wherein the medium further comprises a second labeling substance containing a second fluorescent structure that when illuminated emits light having the second frequency.

9. The system of claim 1, wherein the first photodetector comprises a portion of an imaging array that captures an image containing the test area of the medium.

10. The system of claim 1, wherein the first photodetector and the medium are contained in a single-use module.

11. The system of claim 10, further comprising a reusable module having a receptacle into which the single-use module can be inserted for communication of test signals between the single-use module and the reusable module.

12. The system of claim 11, wherein the reusable module implements a user interface capable of indicating a test result.

13. A process for rapid diagnostic testing, comprising:

applying a sample to a medium in a single-use module that includes a photodetector;

illuminating at least a portion of the medium;

generating an electrical test result signal from the photodetector in the single-use module; and

transmitting the electrical test result signal from the single-use module to a reusable module.

14. The process of claim 13, wherein the medium comprises labeling substance that binds a persistent fluorescent structure to a target analyte, and the photodetector measures light having a frequency characteristic of fluorescent light resulting from illuminating the persistent fluorescent structure.

15. The system of claim 14, wherein the persistent fluorescent structure comprises a

quantum dot.

16. A process for rapid diagnostic testing, comprising:

applying a sample to a medium containing a labeling substance that binds a persistent fluorescent structure to a target analyte;

illuminating at least a portion of the medium; and

generating an electrical signal indicating a detection of fluorescent light.

17. The process of claim 16, wherein the persistent fluorescent structure comprises a quantum dot.

18. A process of claim 16, wherein the medium is in a single-use structure that includes a photodetector that measures fluorescent light from the persistent fluorescent structure.

19. The process of claim 18, further comprising activating a display on the single-use module in response to the electrical test result signal.

20. The system of claim 16, wherein the electrical signal indicates an intensity of the fluorescent light.